

We claim:

- 1 1. A device for controlling processing of data elements, in which a thread is
2 assigned to each data element and no more than one data element enters the
3 device at one time, comprising:
 - 4 - a first unit, in which the context for each thread is entered, and which
5 fetches an instruction during a first clock cycle that is entered in the context of
6 the thread assigned to the incoming data element,
 - 7 - a second unit, which, during a second clock cycle, fetches an
8 instruction, which succeeds a stipulated instruction in the sequence of
9 instructions of a stipulated thread, and
 - 10 - a third unit, which, during the second clock cycle, decodes the
11 instruction that is provided for processing of the data element and fetches a
12 control signal for processing of the data element.
- 1 2. The device according to Claim 1, wherein
 - 2 - the instruction fetched by the second unit is the instruction, whose
3 position in the sequence of instructions of the stipulated thread, is the
4 increment of the position of the stipulated instruction.
- 1 3. The device according to Claim 2, wherein
 - 2 - the second unit is fed with the increment of a count value and an
3 identification value, which designates a thread, and
 - 4 - the second unit, by means of the increment and the identification value,
5 determines the instruction which assumes in the thread designated by the
6 identification value the position designated by the increment assumes.
- 1 4. The device according to Claim 1, wherein
 - 2 - the first unit activates the context of the thread assigned to the
3 incoming data element, if the preceding data element refers to another thread.

- 1 5. The device according to Claim 4, wherein
 - 2 - the first unit fetches an instruction of the thread stated in the activated
 - 3 context and transmits this instruction, which is the first instruction of the
 - 4 thread, in particular, to the third unit for decoding,
 - 5 - the first unit transmits the increment of the position that the instruction
 - 6 fetched by it assumes in the thread, to the second unit.
- 1 6. The device according to Claim 3, wherein
 - 2 - the second unit determines the instruction that succeeds the instruction
 - 3 fetched by the first unit in the thread.
- 1 7. The device according to Claim 1, wherein
 - 2 - for data elements entering the device in succession, the same thread is
 - 3 assigned, as long as the same instruction is used, until a stipulated condition is
 - 4 met.
- 1 8. The device according to Claim 7, wherein
 - 2 - répétition of an instruction is accomplished by the fetching of the same
 - 3 control signal by the third unit.
- 1 9. The device according to Claim 7, wherein
 - 2 - the number of repetitions of an instruction is stipulated by a value,
 - 3 - this value, during a repetition of the instruction, is decremented by the
 - 4 third unit, and
 - 5 - the repetitions are interrupted at the value 0.
- 1 10. The device according to Claim 7, wherein
 - 2 - after fulfillment of the stipulated condition for processing of the data
 - 3 element entering the device next, a stipulated instruction within the thread is
 - 4 used, if the same thread is assigned to this data element.

- 1 11. The device according to Claim 10, wherein
2 - the inquiry into fulfillment of the stipulated condition occurs in the
3 third unit.
- 1 12. The device according to Claim 10, wherein
2 - the stipulated instruction is the instruction fetched by the second unit.
- 1 13. The device according to Claim 12, further comprising:
2 - a connection line for data transmission between the second unit and the
3 third unit, through which the instruction, fetched by the second unit is
4 transmitted to the third unit.
- 1 14. The device according to Claim 12, wherein
2 - the instruction fetched by the second unit is transmitted to the first unit
3 and entered in the context there.
- 1 15. The device according to Claim 10, wherein
2 - the stipulated instruction is fetched by the first unit and transmitted to
3 the third unit for decoding.
- 1 16. The device according to Claim 11, wherein
2 - the third unit, after fulfillment of the stipulated condition, transmits an
3 instruction to the first unit as to which instruction is to be fetched.
- 1 17. The device according to Claim 10, wherein
2 - the stipulated condition, whose fulfillment leads to interruption of
3 repetitions of an instruction, is fulfilled by a signal controllable from outside of
4 device, or by a specific data element entering the device, or by a specific state
5 of the corresponding thread, or by a specific instruction to be processed.

- 1 18. The device according to Claim 7, further comprising:
2 - a program memory, in which the instructions for processing of the data
3 elements are entered, and in which information is entered for each instruction
4 on how many data elements the instruction is to be applied, wherein the
5 program memory has program lines, in particular, in which one instruction and
6 the corresponding information, with reference to the number of repetitions, are
7 entered.
- 1 19. The device according to Claim 1, further comprising:
2 - two series-connected delay units that delay the data element by one
3 clock cycle each.

1 20. A method for controlling processing of data elements, comprising the steps of:
2 - assigning a thread to each data element and no more than one data element
3 enters the device at one time,
4 - fetching an instruction in a first unit during a first clock cycle that is
5 entered in the context of the thread assigned to the incoming data element,
6 - fetching an instruction in a second unit, which succeeds a stipulated
7 instruction in the sequence of instructions of a stipulated thread, and
8 - decoding the instruction that is provided for processing of the data
9 element and fetching a control signal for processing of the data element in a
10 third unit.

1 21. The method according to Claim 20, wherein
2 - the instruction which succeeds the stipulated instruction is the
3 instruction, whose position in the sequence of instructions of the stipulated
4 thread, is the increment of the position of the stipulated instruction.

1 22. The method according to Claim 21, further comprising the step of:
2 - feeding the second unit with the increment of a count value and an
3 identification value, which designates a thread, and
4 - the second unit, by means of the increment and the identification value,
5 determines the instruction which in the thread designated by the identification
6 value assumes the position designated by the increment .

1 23. The method according to Claim 20, further comprising the step of:
2 - activating the context of the thread assigned to the incoming data
3 element by the first unit, if the preceding data element refers to another thread.

- 1 24. The method according to Claim 23, further comprising the step of:
2 - fetching an instruction of the thread stated in the activated context and
3 transmitting this instruction by the first unit, which is the first instruction of the
4 thread, in particular, to the third unit for decoding,
5 - transmitting the increment of the position that the instruction fetched by
6 it assumes in the thread, to the second unit.
- 1 25. The method according to Claim 22, further comprising the step of:
2 - determining the instruction that succeeds the instruction fetched by the
3 first unit in the thread.
- 1 26. The method according to Claim 20, further comprising the step of:
2 - assigning the same thread for data elements entering in succession as
3 long as the same instruction is used, until a stipulated condition is met.
- 1 27. The method according to Claim 26, wherein
2 - repetition of an instruction is accomplished by the fetching of the same
3 control signal by the third unit.
- 1 28. The method according to Claim 26, wherein
2 - the number of repetitions of an instruction is stipulated by a value,
3 - this value, during a repetition of the instruction, is decremented by the
4 third unit, and
5 - the repetitions are interrupted at the value 0.
- 1 29. The method according to Claim 26, wherein
2 - after fulfillment of the stipulated condition for processing of the data
3 element entering the device next, a stipulated instruction within the thread is
4 used, if the same thread is assigned to this data element.

- 1 30. The method according to Claim 29, wherein
2 - the inquiry into fulfillment of the stipulated condition occurs in the
3 third unit.
- 1 31. The method according to Claim 29, wherein
2 - the stipulated instruction is the instruction fetched by the second unit.
- 1 32. The method according to Claim 30, wherein
2 - the instruction fetched by the second unit is transmitted to the first unit
3 and entered in the context there.
- 1 33. The method according to Claim 29, wherein
2 - the stipulated instruction is fetched by the first unit and transmitted to
3 the third unit for decoding.
- 1 34. The method according to Claim 30, further comprising the step of:
2 - after fulfillment of the stipulated condition, transmitting an instruction
3 by the third unit to the first unit as to which instruction is to be fetched.
- 1 35. The method according to Claim 29, wherein
2 - the stipulated condition, whose fulfillment leads to interruption of
3 repetitions of an instruction, is fulfilled by a signal controllable from outside of
4 device, or by a specific data element entering the device, or by a specific state
5 of the corresponding thread, or by a specific instruction to be processed.
- 1 36. The method according to Claim 26, further comprising the steps of :
2 - entering the instructions for processing of the data elements into a
3 program memory, wherein information is entered for each instruction on how
4 many data elements the instruction is to be applied, wherein the program
5 memory has program lines, in particular, in which one instruction and the
6 corresponding information, with reference to the number of repetitions, are
7 entered.

- 1 37. The method according to Claim 20, further comprising the step of :
- 2 - delaying the data element by two clock cycles.